## Amendments to the Claims

What is claimed is:

1. (Original) A method for improving the octane number of a synthetic naphtha stream, comprising:

   (A) providing a hydrocarbon feedstream comprising primarily $C_4$-$C_8$ acyclic hydrocarbons, wherein the hydrocarbon feedstream has an octane number and is derived from a hydrocarbon synthesis process;

   (B) reacting the hydrocarbon feedstream under aromatization promoting conditions so as to convert at least some of the acyclic hydrocarbons to aromatic hydrocarbons and generate a cyclized hydrocarbon stream, wherein the cyclized hydrocarbon stream includes said aromatic hydrocarbons and unconverted acyclic hydrocarbons; and

   (C) reacting the cyclized hydrocarbon stream under isomerization promoting conditions so as to convert at least some of the unconverted acyclic hydrocarbons to branched hydrocarbons and generate a cyclized, isomerized hydrocarbon stream, wherein the cyclized, isomerized hydrocarbon stream includes aromatic hydrocarbons and branched hydrocarbons, and has an octane number greater than the octane number of the hydrocarbon feedstream.

2. (Original) The method of claim 1, wherein the hydrocarbon feedstream is a Fischer-Tropsch naphtha stream.

3. (Original) The method of claim 1, wherein the cyclized, isomerized hydrocarbon stream comprises branched hydrocarbons; paraffinic hydrocarbons; olefins; substituted $C_6$-$C_8$ aromatic hydrocarbons; or combinations thereof.

4. (Original) The method of claim 1, wherein steps (B) and (C) occur in more than one reactor.

5. (Original) The method of claim 1, wherein steps (B) and (C) occur in the same reactor.

6. (Original) The method of claim 5, wherein steps (B) and (C) occur in sequence.

7. (Original) The method of claim 1, wherein step (B) comprises passing hydrogen and at least a portion of the hydrocarbon feedstream over a shape-selective catalyst.

8. (Original) The method of claim 7, wherein step (B) further comprises a hydrogen to hydrocarbon molar ratio from about 0.1 to about 10.

9. (Original) The method of claim 1, wherein the hydrocarbon feedstream comprises more than 80% paraffins.

10. (Original) The method of claim 1, wherein the branched hydrocarbons comprise isoparaffins.

11. (Original) The method of claim 1, wherein step (B) further produces hydrogen.

12. (Original) The method of claim 11, wherein the hydrogen is fed to step (C).

13. (Original) The method of claim 1, wherein step (C) comprises passing hydrogen and the cyclized hydrocarbon stream over a solid phosphoric type catalyst.

14. (Original) The method of claim 1, wherein step (C) comprises passing hydrogen and the cyclized stream over a shape-selective catalyst.

15. (Original) The method of claim 14, wherein the shape-selective catalyst comprises at least one material selected from the group consisting of MCM-22, L-zeolite, K-form L-zeolite, Y-zeolite, HY, ZSM-5, ZSM-11 and HZSM-5.

16. (Original) The method of claim 1, wherein step (C) further comprises a hydrogen to hydrocarbon molar ratio of from about 0.1 to about 10.

17. (Original) The method of claim 1, further comprising

(D) feeding at least a portion of the cyclized, isomerized hydrocarbon stream to a fractionator so as to separate unconverted hydrocarbons from the branched and aromatic hydrocarbons.

18. (Original) The method of claim 17, wherein the unconverted hydrocarbons are recycled to at least one of steps (B) and (C).

19. (Original) A method for improving the octane number of a synthetic naphtha stream, comprising:

(A) providing a hydrocarbon feedstream comprising primarily $C_4$-$C_8$ acyclic hydrocarbons, wherein the hydrocarbon feedstream has an octane number and is derived from a hydrocarbon synthesis process;

(B) reacting the hydrocarbon feedstream under isomerization promoting conditions so as to convert at least some of the acyclic hydrocarbons to branched acyclic hydrocarbons and generate an isomerized hydrocarbon stream, wherein the isomerized hydrocarbon stream includes branched acyclic hydrocarbons and unconverted acyclic hydrocarbons; and

(C) reacting the isomerized hydrocarbon stream under aromatization promoting conditions so as to convert at least some of the unconverted acyclic and isomerized acyclic hydrocarbons to aromatic hydrocarbons and generate a cyclized, isomerized hydrocarbon stream, wherein the cyclized, isomerized hydrocarbon stream includes aromatic hydrocarbons and branched acyclic hydrocarbons, and has an octane number greater than the octane number of the hydrocarbon feedstream.

20. (Original) The method of claim 19, wherein the hydrocarbon feedstream is a Fischer-Tropsch naphtha stream.

21. (Original) The method of claim 19, wherein the cyclized, isomerized hydrocarbon stream comprises branched hydrocarbons; paraffinic hydrocarbons; olefins; substituted $C_6$-$C_8$ aromatic hydrocarbons; or combinations thereof.

22. (Original) The method of claim 19, wherein step (B) comprises passing hydrogen and the hydrocarbon feedstream over a solid phosphoric type catalyst.

23. (Original) The method of claim 19, wherein step (B) comprises passing hydrogen and the hydrocarbon feedstream over a shape-selective catalyst.

24. (Original) The method of claim 23, wherein the shape-selective catalyst comprises at least one material selected from the group consisting of MCM-22, L-zeolite, K-form L-zeolite, Y-zeolite, HY, ZSM-5, ZSM-11 and HZSM-5.

25. (Original) The method of claim 19, wherein step (B) further comprises a hydrogen to hydrocarbon molar ratio of from about 0.1 to about 10.

26. (Original) The method of claim 19, wherein step (C) comprises passing hydrogen and substantially all of the isomerized hydrocarbon stream over a shape-selective catalyst.

27. (Original) The method of claim 26, wherein step (C) further comprises a hydrogen to hydrocarbon molar ratio from about 0.1 to about 10.

28. (Original) The method of claim 19, wherein step (C) further produces hydrogen.

29. (Original) The method of claim 28, wherein the hydrogen produced in step (C) is fed to step (B).

30. (Original) The method of claim 19, further comprising

(D) feeding at least a portion of the cyclized, isomerized hydrocarbon stream to a fractionator so as to separate unconverted hydrocarbons from the isomerized, cyclic hydrocarbons.

31. (Original) The method of claim 30, wherein the unconverted hydrocarbons are recycled to at least one of steps (B) and (C).

32. (Withdrawn) A method for producing olefins, solvents, and light aromatic hydrocarbons from a synthetic naphtha stream, comprising:

(A) providing three synthetic hydrocarbon streams, including:

1) a light hydrocarbon stream comprising primarily $C_4$-$C_5$ acyclic hydrocarbons,

2) an intermediate hydrocarbon stream comprising primarily $C_6$-$C_8$ acyclic hydrocarbons; and

3) a heavy fraction comprising primarily $C_9$-$C_{11}$ acyclic hydrocarbons;

(B) passing the light hydrocarbon stream and optionally, at least a portion of the heavy hydrocarbon stream to a steam cracker;

(C) cracking in the presence of steam at least a portion of the light hydrocarbon stream and optionally, at least a portion of the heavy hydrocarbon stream under suitable cracking conditions in said steam cracker so as to convert at least a portion of the acyclic hydrocarbons to olefins and to produce a steam cracker effluent, wherein the stream cracker effluent comprises said olefins; and

(D) reacting the intermediate hydrocarbon fraction under aromatization promoting conditions so as to convert at least some of the acyclic hydrocarbons to aromatic hydrocarbons and generate a cyclized hydrocarbon stream, wherein the cyclized hydrocarbon stream includes said aromatic hydrocarbons and unconverted acyclic hydrocarbons, and has an octane number higher than that of the intermediate hydrocarbon fraction,

wherein the method further includes one hydrotreating step selected from the group consisting of: hydrotreating the hydrocarbon feedstream with hydrogen prior to step (B); hydrotreating the light hydrocarbon stream and optionally at least a portion of the heavy hydrocarbon stream with hydrogen prior to step (C); and combination thereof.

33. (Withdrawn) The method of claim 32, wherein the three synthetic hydrocarbon streams comprise Fischer-Tropsch naphtha cuts.

34. (Withdrawn) The method of claim 32, wherein step (D) comprises passing hydrogen and the hydrocarbon stream over a shape-selective catalyst.

35. (Withdrawn) The method of claim 34, wherein step (D) further comprises a hydrogen to hydrocarbon molar ratio from about 1 to about 20.

36. (Withdrawn) The method of claim 32, wherein the branched hydrocarbons comprise isoparaffins.

37. (Withdrawn) The method of claim 32, further comprising

(E) feeding at least a portion of the cyclized hydrocarbon stream to a fractionator so as to separate unconverted hydrocarbons from the aromatic hydrocarbons.

38. (Withdrawn) The method of claim 37, wherein the unconverted hydrocarbons are recycled to step (D).

39. (Withdrawn) The method of claim 32, wherein step (D) further produces hydrogen.

40. (Withdrawn) The method of claim 32, wherein the olefins comprise ethylene, propylene, or combination thereof.

41. (Withdrawn) The method of claim 32, wherein suitable cracking conditions in step (C) comprise a steam to hydrocarbon molar ratio of from about 3:7 to about 7:3.

42. (Withdrawn) The method of claim 32, wherein the steam cracker effluent comprises at least about 40 weight percent of olefins.

43. (Withdrawn) The method of claim 32, wherein the steam cracker effluent comprises at least about 20 weight percent ethylene.

44. (Withdrawn) The method of claim 32, wherein at least a portion of the heavy hydrocarbon stream is sent to the steam cracker.

45. (Withdrawn) The method of claim 44, wherein another portion of the heavy hydrocarbon stream that is not sent to the steam cracker is employed as a solvent.